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SUBSIDIZATION AS EXCHANGE

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ABSTRACT

The relationship between a subsidy-receiving firm and the government granting the subsidy can be conceptualized as an agency relation, with the government in the role of the principal, and the firm in the role of the agent. The economic theory of agency relations suggests what formal characteristics of the subsidy scheme and what conditions of the subsidy contracts are to be expected if the government wants to discipline effectively the behaviour of subsidy-receiving firms. These expectations are discussed using the example of a Dutch research subsidy scheme. It appears that most of the expected conditions are indeed embodied in the formal subsidy scheme and in the subsidy contracts. However, there are signs that the informal relationship between the parties concerned deviates in important ways from what the formal documents would make us believe. Conclusions pertaining to the usefulness as well as the limitations of the proposed conceptualization of subsidy relations are

drawn, and recommendations with regard to the design and implementation of subsidy schemes are made.

INTRODUCTION

Subsidization as a policy instrument seems to be going out of vogue. On the one hand budgetary deficits cause governments to reconsider critically all policy instruments entailing substantial financial outflows. On the other hand the belief in the capacity of governments to guide economic activity by any means has declined considerably. And subsidization shares the general characteristic of policy instruments in that they tend to become more resource-intensive if they are less coercive.⁽¹⁾ The amount of money needed to produce an effect rises as subsidies are used in a less discriminating way (because of the larger group of potential recipients), whereas a more discriminating use makes a stronger appeal to the guiding capacity of the government.

All the same, subsidization can be an attractive instrument. The autonomy of the recipient of a subsidy remains unimpaired, a crucial consideration if this autonomy is deemed to be important for practical, juridical or ideological reasons. This is for instance the case in industrial or technology policy, in the context of which the government interferes with the market mechanism which forms the foundation of the capitalist economy. Therefore it is not surprising that industrial and technology policy are primarily implemented by means of subsidies, be it to bail out firms in declining industries, or to stimulate research and development of firms in rising sectors. These policies will remain with us as long as governments and their constituencies are unwilling to take for granted the outcome of economic change processes, but rather try to defend and improve the positions of their countries' firms on the world market and to boost the performance of the national economy,

in terms of production, employment, export, or any other measure.⁽²⁾

Consequently, subsidies to private firms, although perhaps on the decline at present, will probably in the coming decades remain an element in the policy instrument mix of governments. Therefore it is interesting to have a close look at this instrument, and to probe into the mechanisms that supposedly bring about the desired effects. In this article the case of research subsidies is discussed to characterize the relationship between the government granting the subsidy and the recipient firm. This subsidy relation is conceptualized as an exchange relation in which, as in every exchange relation, there is a tension between the goals of both parties. The government wants (or should want) to have as much 'value for money' as possible. This means - as will be reasoned below - that the government will attach to the granting of the subsidy a number of conditions that are supposed to maximize the societal pay-off of the subsidized research projects. The subsidy-receiving firm on the other hand may be assumed to want as much 'money for value' as possible, meaning in general that it will try to minimize the restrictions put on the use of the subsidy.

In the next section the conceptualization of the subsidy relation as an exchange relation is discussed and this conceptualization is put into the perspective of other approaches. After that, some general (normative) expectations are put forth with regard to subsidy conditions on the basis of the economic theory of agency. Subsequently these expectations are tested against one particular example of a research subsidy scheme, viz. the subsidy scheme that has been active in the Netherlands in the period 1984-1987. The penultimate section puts the findings of the preceding analysis into perspective by emphasizing the differences between the formal subsidy scheme and contracts and the informal subsidy relationship. Conclusions and recommendations follow.

SUBSIDIZATION AS EXCHANGE

The first step in the conceptualization envisaged here is the assumption that in the subsidy relation both parties *receive* as well as *give up* some economic good. If we first focus on the firm, the case is relatively straightforward: 'a subsidy always requires a specific economic *quid pro quo* or performance from the recipient in the market to which the subsidy is tied'.⁽³⁾ In the research subsidy transaction the firm receives the promise to receive a sum of money at a specified point in the future. In return the firm promises to perform certain more or less specified activities (a research project).

The fruits of these activities accrue to the company, however, and for this reason it may be somewhat problematic to acknowledge the exchange nature of subsidization. But presumably the benefits of the subsidized activities do not fall to the firm alone, but also to society at large, or the subsidy should not have been given in the first place. What makes the subsidy relation a special kind of exchange relation is the circumstance that the *quid pro quo* can be seen as an externality of the project performed by the firm, viz. a public benefit that is not reflected in the market value of the project. I will return to this point later.

The argument that the firm in some cases would also have performed the activities in question without the subsidy, and that it therefore, in these cases, does not give anything in return does not hold.⁽⁴⁾ At the time the subsidy is granted, the firm may know it plans to perform a project irrespective of the subsidy, but the government does not. So the firm's promise to do something it planned to do anyway is not without value to the government. Moreover, in accepting the subsidy the firm resigns some of its freedom of action: if it decides not to carry out the project after all, it has to face the consequences of

breaching the agreement with the government. Finally, the firm also offers some verification facilities to the government. It agrees to permit some kind of audit to enable the government to make sure that the subsidy is spent in the proper way.

If we look at the government, the benefits and burdens in the exchange are just the reverse of those of the recipient firm. But here two problems arise. In the first place a benefit to society at large is not necessarily a benefit to the government, or to that part of government that is in charge of the implementation of the subsidy scheme. This means that in analyzing a subsidy exchange we will have to consider the possibility that the *quid pro quo* (partly) consists of something of value to the government department implementing the scheme (e.g. the publicity-value of a spectacular project) rather than the public benefit that forms the official rationale for the subsidy.

In the second place, as stated above, the public benefit is an externality of the research project.⁽⁹⁾ For instance, the public benefit of a subsidized research project may be considered to lie in its 'ripple-effects' on other firms and on research institutes and universities, in its employment effect, or in its balance of payments effect. None of these form marketable economic goods, and consequently it is difficult if not impossible to determine an appropriate price. This rules out the possibility of an outright assessment of the proportionality of the *quid pro quo* received by the government, but it would be missing the point to conclude that consequently there is no exchange taking place at all between the government and the subsidy-receiving firm.

The above-mentioned considerations regard the substance of the exchange, the question of what is being exchanged for what. In the case of a research subsidy however the *quid pro quo* delivered by the firm, the research project, consists in an activity that still has to be performed at the moment of the

granting of the subsidy. The promise to pay a subsidy is exchanged for the promise to execute a project. As it is impossible to plan a research project in detail, the performance to be delivered by the firm can not be specified unequivocally *ex ante*. But the way in which the firm executes the project can influence its societal pay-off. For instance, from a societal point of view it is undesirable that the firm uses the subsidy to produce know-how that is already available elsewhere in the national business sector. Also, research subsidies should not be used to finance development projects, for the results of the latter activities are generally much more product- and firm-specific, and may consequently be expected to produce less strong 'ripple-effects' to other firms and other industrial sectors. However, from the point of view of the firm, a research project duplicating research performed by other firms may be part of a useful overtaking manoeuvre, and a shift from research to development activities may be desirable if the firm is in need of quick results.

Consequently there is at least a potential conflict of interests between the subsidy granting government and the subsidy receiving firm. In order to secure an adequate *quid pro quo* the government has to get a grip on the production process of that *quid pro quo*. More in general we can expect that if the performance and/or *quid pro quo* take shape only in the course of time, the parties to an exchange will pay equal attention to the substance and the process of the exchange.⁽⁶⁾ In the case of the research subsidy exchange the *quid pro quo* can hardly be separated from the process of its production. Therefore it is to be expected that the government, in the subsidy contracts, will reserve certain rights for itself in order to be ensured a say in the decision-making with regard to the research project. Indeed, if the government takes the realization of societal benefits seriously, it will *have* to ensure itself that influence. In the next section I will formulate some apposite general expectations with regard to conditions in subsidy contracts.

Viewing the subsidy relation as an exchange relation, although not entirely new⁽⁷⁾, is rather unusual. As a matter of fact, in the legal literature there is no consensus on the exchange and contractual nature of subsidy agreements. In a penetrating study Henke⁽⁸⁾ comes to the conclusion that the subsidy relation should be seen as contractual, but that the contracts in question are governed by public rather than private law. In the Dutch legal literature - most pertinent because a Dutch subsidy scheme is used as an illustration in this article - various opinions are voiced, from the view that subsidization is a unilateral government act (and hence the subsidy relation is not contractual)⁽⁹⁾, to the standpoint that the subsidy relation is of the nature of a private law contract⁽¹⁰⁾, with various intermediate positions.⁽¹¹⁾

Practitioners interviewed in the course of the investigation into the Dutch subsidy scheme, the results of which are reported in below, displayed like differences of opinion. Government officials tended to see subsidization more as a unilateral government act, whereas representatives of firms stressed the mutuality of subsidy agreements. Somewhat inconsistently, government officials thought much of the legal enforceability of the subsidy contracts, which seems to indicate that they considered the relationship as primarily contractual. These perceptions are important because they presumably influence the choice of a subsidy as a policy instrument, as well as the subsequent interaction with firms in the context of the subsidy relation.⁽¹²⁾ Representatives from private firms - specifically the larger firms - more often saw the relationship as governed by mutual trust rather than legal enforceability.⁽¹³⁾ We will return to this point in the penultimate section of the article.

Neither the opinions of these practitioners, nor those voiced in the legal literature are necessarily conclusive, though. The important thing is whether the actual circumstances of the subsidy relation permit the use of a contractual point of view in

the analysis. The crucial point here is the fact that a firm has to *accept* the subsidy for the subsidy relationship to come about, and consequently that a mutual rather than a unilateral act in law lies at the basis of the subsidy relation. Whether the relationship thus formed is governed by private or by public law is of secondary interest in the context of a primarily economic analysis.

Other ways of looking at government-industry relations that entail other ways of conceptualizing the subsidy relation (although these conceptualizations are not always made explicit) are e.g. historical and institutional analyses⁽¹⁴⁾, analyses of power, dependency and influence relations between government agencies and private firms⁽¹⁵⁾, analyses of policy networks that consist of an amalgam of exchange, power and other relationships⁽¹⁶⁾, and analyses of interactions in the process of policy implementation.⁽¹⁷⁾

The approach propagated in this article shares with most of the approaches mentioned above the characteristic that the decision-making with regard to the (implementation) of a government policy is treated explicitly as the outcome of a process of interaction between the government agencies and firms concerned. This means that the strategic nature of this decision-making, the fact that decisions by one party are made in the expectancy of and conditional to decisions made by the other party, is given appropriate weight. In this respect all these approaches contrast favourably with approaches focusing on governmental decision-making only⁽¹⁸⁾, or with approaches based on a theoretical model that *a priori* condemns subsidization as inefficient, like Austrian economics.⁽¹⁹⁾ On top of that, the agency approach to subsidy relations has the advantage that it focuses on the benefits and costs of the scheme in question. Benefit/cost analysis forms the basis for a balanced analysis of policies.⁽²⁰⁾

Conceptualization of the subsidy relation as an exchange relation implies a partial analysis, compared with some of the other approaches mentioned, that consider a multitude of factors. The relative paucity of factors considered in the approach proposed here is acceptable only if the few factors that are taken into account, viz. the performance and quid pro quo and the process of decision-making with regard to the exchange, indeed come to the heart of the matter. More specifically, the proposed analysis tends to focus attention on the formal (legal or quasi-legal) structure of the subsidy scheme investigated. Although this formal structure has in a number of case studies of government policies been shown to be important for the implementation process⁽²¹⁾, other factors may occasionally carry more weight.

Here also, the proof of the pudding is in the eating, hence the importance of the empirical flavour added later in the article. As a matter of fact, one of the findings of the case study included in this paper is the fact that the formal subsidy conditions and contracts in some instances misrepresent the subsidy relationships as they actually developed. But before we turn to these problems some further elaboration of the research subsidy exchange will take place in the next section.

AGENCY THEORY

As stated above, in the subsidy relation the firm assumes the obligation to perform certain activities in conformity with the agreement with the government. As the activities in question form a research project, which is of an uncertain nature, it may be assumed that they cannot completely be planned *ex ante*. Thus the firm has to take decisions in the course of the execution of the project, and as these decisions may influence the benefit of the project accruing to the government, the subsidy conditions will presumably specify that the government has a say in this decision-making process.

This situation is akin to those studied in the economic theory of agency. In agency relations one party, designated as the agent, performs a task for or on behalf of the other party, designated as the principal. In return the principal pays a fee to the agent. In performing the task the agent has some leeway, and the decisions he takes may influence the value of his performance to the principal. But this value is not completely determined by the decisions of the agent, for the pay-off to the principal is also influenced by factors out of the control of the agent, the 'state of nature'. The agent chooses a course of action that maximizes his individual utility, taking into account the differential utility he derives from different actions, as well as the expected fee. The principal's problem is to design a contract that maximizes the net pay-off of the task accruing to him, taking into account the fee to be paid to the agent and the fact that the agent in his decision-making will be led by considerations of his own individual utility rather than by the pay-off to the principal.

This problem situation gets its salience through the assumption that information is imperfect at the outset and costly to acquire. Information asymmetry is the rationale for granting decision-making power to the agent: presumably the agent in the execution of his task has at his disposal information not available to the principal. But the imperfectness and costliness of information also entails the problem that the principal cannot with certainty tell whether the decisions taken by the agent are optimal (from the principal's point of view) or not, that is, if he has information concerning these decisions in the first place.

Under this condition of imperfect and costly information, the principal's problem can be solved by making the fee variable with either the pay-off of the task or the way in which the task is executed, i.e. the input provided by the agent. The aim of the first strategy is to motivate the agent to take decisions that are favourable to the principal, the aim of the second

strategy to curtail the freedom of choice of the agent. Both strategies entail costs: the first aligns only imperfectly the preferences of principal and agent as the pay-off is also influenced by the 'state of nature'. The second entails costs of monitoring the agent. Both strategies can be combined to form a mixture that is optimal given the characteristics of the task and the preferences of principal and agent.

This crude discussion of the rudiments of agency theory suffices for the purpose of this article.⁽²²⁾ The question now is whether the subsidy relation can usefully be regarded as an agency relation, with the government in the role of the principal and the firm in the role of the agent. In my view the crucial point is that the government has a genuine interest in the research project of the firm, and pays a price to promote the furtherance of this interest. Furthermore the government stands in a risk-bearing position, for the pay-off of the project is uncertain. A third vital characteristic of the situation is that the firm, through the decisions it takes in implementing the project, influences the pay-off to the government and to society. This combination of factors makes that the relationship between the subsidy-granting government and the subsidy-receiving firm shows all the fundamental elements of an agency relation.

Now then, granting that the subsidy relation bears the characteristics of an agency relation, what clues with regard to the subsidy relation can be deduced from the agency literature?

The basic observation is that the principal will try to discipline the agent by making the fee variable with the pay-off of the task, the input provided by the agent, or both. What kind of fee scheme will be chosen depends on the costs of monitoring the agent's behaviour and of measuring the pay-off of the task. In the case of the subsidy-relation measurement of the pay-off of the task is extremely difficult. The societal benefit which forms the pay-off to the government cannot possibly be estab-

lished in such an objective way that it can form a basis for the fee scheme. Consequently, the strategy of making the fee (subsidy) variable with the pay-off of the project is impeded.

The only thing the government *can* do to promote the maximization of the societal benefit is to follow the second strategy mentioned above, making the subsidy variable with the way in which the task is executed by the agent. This second strategy entails two sub-strategies, which logically will be combined. The first sub-strategy consists in making the subsidy variable with input indicators, e.g. the amount of money spent on the project by the firm. This sub-strategy will work well in as far as the market value of the project (= the pay-off to the firm) is positively related to the societal benefit. The second sub-strategy consists in making payment of the subsidy conditional on compliance with rules concerning the choice of appropriate actions. Actions that are presumed to have a negative effect on the societal benefit of the project will be explicitly excluded from the firm's 'action set'. Whereas the first sub-strategy can be realized using a continuous fee scheme (e.g. if the firm's input stays 10% below the agreed level, the subsidy will be cut down by 10%), the second sub-strategy leads to discontinuities in the fee scheme, for a firm either complies with the rules or does not.

Both sub-strategies discussed above can be seen as attempts of the government to influence the decision-making of the firm. As the firm executing the projects self-evidently has an information advantage vis-à-vis the government, it would be inefficient if the government meddled in all decisions. The differentiation between 'decision management' and 'decision control' made by Fama and Jensen⁽²³⁾ suggests a logical division of labour between the government and the subsidy receiving firm. Fama and Jensen distinguish four elements in the decision-making process: initiation, ratification, implementation, and monitoring. The combination of initiation and implementation is

called 'decision management' by Fama and Jensen, and the combination of ratification and monitoring 'decision control'. Fama and Jensen hypothesize that decision systems in which 'decision management' is separated from 'decision control' will appear if, for efficiency reasons, residual-risk bearing is separated from 'decision management'. Clearly this separation is also natural in the subsidy relation. Thus the division of labour to be expected between the government and the subsidy-receiving firm will be such that the firm takes the day-to-day decisions with regard to the project, and the government is only involved in case of non-trivial project changes. The government will have to leave the decision management to the firm concerned, and will have to make most of ratification (selection of research projects to be subsidized and the authorization of project changes), and of monitoring (measurement of the actual performance of the firms).

The agency literature furthermore suggests that it will be efficient if the principal has the unilateral power to terminate or revise the contract with the agent(s).⁽²⁴⁾ This 'unilateral termination clause' is a mechanism for disciplining the agent. Presumably this mechanism will be the more important the more the agency relation involves a task that is difficult to specify *ex ante*, and the more the agent has an information advantage vis-à-vis the principal. In the relationship between government and firm in case of a research subsidy both conditions seem to hold strongly.

A unilateral termination clause has the function of removing completely or partly the burden of evidence from the shoulders of the principal in case of a perceived breach of the agreement by the agent. In the most extreme form, i.e. termination at will, a perceived breach of the agreement is not even necessary as an inducement to the termination, for no motivation of the decision to terminate is needed. But also less extreme versions of this clause can be thought of, like: 'the principal has the right to

terminate the agreement if according to his best information the agent has not complied with the terms of the contract', shifting the burden of evidence to the agent, who now has to prove that he has *not* breached. In the research subsidy relation a (mitigated) unilateral termination clause is to be expected, given the serious information disadvantage of the government.

To recapitulate: conceptualization of the subsidy relation as an agency relation leads us to expect that if the government pursues maximization of 'value for money' it will:

- make the subsidy variable with the firm's input in the project, measured in money, labour hours, or any other measure;
- make the subsidy conditional on compliance with rules concerning the choice of appropriate actions;
- specify in the subsidy scheme procedures of ratification and monitoring of the subsidized research projects;
- include a (mitigated) unilateral termination clause in the subsidy contracts.

In the next section these expectations will be used in an analysis of a Dutch research subsidy scheme, analogous to the way Masten⁽²⁵⁾ uses insights from transaction cost economics to evaluate military procurement procedures.

ILLUSTRATION: A SUBSIDY SCHEME IN HOLLAND

The subsidy scheme that will be used as an illustration here is the ROAG-scheme, a government scheme for the subsidization of research projects of private firms in the Netherlands, active in the years 1984-1987. 'ROAG' is an acronym of 'Research Op Aandachts Gebieden', which can be translated as 'research within priority areas'. In the context of this scheme a number

of large research programmes from firms like Philips, AKZO, Gist-Brocades, Océ, DSM and the Dutch subsidiary of Dow Chemicals have been subsidized, but also a multitude of projects from small and medium-sized firms. In sum, approximately 250 million dollars in subsidies has been granted to some 120 projects. The description of this scheme below is based on an in-depth case study of the policy making and implementation processes and of the relationship between the Dutch Ministry of Economic Affairs and sixteen of the subsidy-receiving firms. The results of this study are reported in detail elsewhere.⁽²⁶⁾

The conditions of the ROAG-scheme and criteria for the assessment of applications for subsidization were formulated in a November 1985 internal policy paper, which has been the basis for most of the ROAG-deals.⁽²⁷⁾ The criteria pertained e.g. to the technological novelty of the project; its chance of success; and its importance for the Dutch economy.

The most important criterion in the eyes of the Ministry however was that of the growth of the total R&D efforts of the firm in Holland. This criterion, and the related condition in the subsidy contracts, embodied an essential element of the ROAG, viz. the pretension not just to support existing research activities, but to generate new and additional research. It was contained in formal and specific agreements concerning the total amount to be spent on R&D by the firm during the subsidy-period.

If a project complied with the terms of the criteria and the Minister decided to grant a subsidy, a maximum amount was determined on the basis of the expected project costs. The firm could receive advances during the execution of the project, but the subsidy was determined definitely only at the end of the project or the subsidy period. This subsidy could be lower than the maximum stated, e.g. in case the realized project costs were lower than predicted. Theoretically, the Ministry could also

refuse definite determination of the subsidy, in which case the subsidy to be received by the firm would effectively be set at nil, and advances paid could be reclaimed (see below).

If a subsidy was granted, the firm received a letter specifying 27 conditions. In these conditions the Ministry had reserved to itself large discretionary powers in the implementation of the scheme. For almost all the important general conditions the Minister could make exceptions at the request of an applicant. It was also explicitly stated that the Minister could attach further conditions to his permission to deviate from one of the standard rules.

The Ministry also had quite some leeway in determining whether a firm had complied with the conditions or not. Particularly a condition that stated that the research project had to be executed according to the plan submitted at the application for the subsidy, left room for interpretation. In the light of the difficulties in planning and controlling research projects it will be clear that it would not be realistic to expect the firm to stick exactly to the submitted plan. It was up to the Ministry to decide what deviation from the plan still was acceptable.

The main conditions can be summarized in seven points, using the terminology of agency theory:

- *Ex ante specification of the task*: the project should be executed according to the plan, the total R&D expenses over the subsidy period should reach the agreed amount, the implementation of the project as well as the subsequent development and production activities are to take place in Holland;
- *Decision-making during implementation of the project*: supplementary conditions can be set in case of permission to deviate from the *ex ante* specification of the task;

- *Ratification procedures*: no deviation from the *ex ante* specification of the task is permitted without previous written consent;
- *Monitoring procedures*: requirements concerning the (project) administration, project reports, and inspections;
- *Appropriation of marketable project results*: rules for the preservation and use of the know-how resulting from the project;
- *Variability of the subsidy with performance indicators*: in case the total expenses of the firm on R&D fall short, or if project cost turn out to be lower than the original estimate, the amount of the subsidy will be lowered;
- *Subsidy conditional on compliance with rules*: in case of non-compliance with one of the conditions advance payments will be refused or reclaimed, and no definite determination of the subsidy will take place.

It can be concluded that the expected ratification and monitoring procedures are indeed explicitly included in the ROAG-contract (the ratification procedures in the conditions as well as in the criteria), as are stipulations concerning the variability of the subsidy with performance indicators and the conditionality of the subsidy on compliance with the rules. However, only a very weak form of the unilateral termination clause can be discerned in the last of the conditions printed above. The circumstances under which the government can decide to refuse definite determination of the subsidy are specified, and it is in contrast not clear under which - if any - circumstances the firm can back out of the agreement. But the burden of evidence is not clearly shifted to the firm, and in the light of the information advantage of the firm this may in practice be an important impediment to termination.

The weakness of this unilateral termination clause may be one of the causes for the difference between the formal subsidy contracts and the informal subsidy relations to be discussed in the next section.

THE INFORMAL SUBSIDY RELATION

Above I have concentrated on the formal characteristics of the subsidy relation, i.e. the characteristics as they can be deduced from the terms of the subsidy scheme. But sometimes formal conditions remain black-letter-law with very limited impact on the subsidy relation as it evolves in everyday life.

In the case study of the ROAG-scheme, the perception of the subsidy relationship of respondents from the Ministry of Economic Affairs and of respondents from the subsidy receiving firms was measured. The second category of respondents was split up into two groups. The first group consisted of respondents from firms which had entered into a package deal with the Ministry ('frame-contract'), covering, apart from the ROAG-subsidy, development credits and investment subsidies. Most of these firms were big multinationals like Philips and AKZO. The second group consisted of mostly small and medium-sized firms that had entered into simple standard ROAG-contracts.

Interviews were conducted with 5 respondents from the Ministry, 6 respondents from 'frame-contract' firms, and 10 respondents from 'standard contract' firms. On the basis of these interviews, scores on a number of variables could be constructed which made comparison between the three groups possible (see the Appendix for methodological details).

One of the findings is that the government respondents tended to have a much more legalistic view of the subsidy relation than the respondents from the 'framecontract' firms: they scored significantly higher on the variable measuring the importance attached to legal enforceability of the subsidy contract. The firm respondents appeared to see the subsidy relationship as trust-based, rather than strictly contractual. These respondents expressed trust in the Ministry, and maintained that this trust was more important than the actual legal enforceability of the promise to pay a subsidy. The importance attached to trust is - not very surprisingly - negatively correlated with the importance attached to legal enforceability.

These differences in the perception of the subsidy relationship understandably also had repercussions on the interpretation of the conditions of the formal contract. Significant differences cropped up with regard to the government's right to retract the subsidy if the firm does not keep to the terms of the agreement. This condition and the rule that the firm should ask the government's consent previous to the implementation of project changes are of vital importance to the subsidy-granting government. Only if they are lived up to can the government hope to exert its rights embodied in the formal contract in a meaningful way.

Although some of the firm respondents indicated to take the 'previous consent' condition very seriously, others tended to see the text of the subsidy contract as black-letter-law, and expressed the belief that the government would always be very reasonable if it came to project changes. Besides, the firm always has a tremendous information advantage if it comes to discussing the merits of desired project changes. Furthermore the actual management of the project was seen as a prerogative of the company:

If the Ministry would really enforce conditions like this one, they would be taking the chair of the management. That's

impossible, nowadays even more so than before. One only has to say: you don't want to take our chair, do you? Then it's finished very quickly (interview with firm respondent)

With regard to the 'previous consent' rule, most of the government respondents acknowledged that in practice the firms do not always ask permission for project changes, and actually often not even notify the government. But all the same, the rule is seen as important:

It really gives you an opening to the firms. These things you need just in case something goes wrong. It doesn't mean that you always attain exactly what's literally specified by such a condition, but it offers an opportunity to build a position (interview with government respondent)

The majority of the firm respondents, however, reported that it is impossible and unnecessary to ask the government's consent before implementing project changes. Some of these respondents see ritual features in the Ministry's attitude in this respect:

One receives a reprimand now and then, but then, it's part of the game (interview with firm respondent)

In sum, the interviews suggest that the firm respondents, and particularly those from the 'frame-contract' firms, do not take the two contractual conditions considered very seriously. And probably rightly so, for although most of the firm respondents state that project changes without the government's previous consent occurred regularly, the government in no case used the weapon of retraction.

CONCLUSIONS AND RECOMMENDATIONS

In this section I will draw some conclusions with regard to the conceptualization of subsidy relations as exchange relations (or more particularly as agency relations). Also, on the basis of the findings in the case study of the ROAG-scheme, some general recommendations for the design and implementation of subsidy schemes are made.

The use of an exchange perspective in the analysis of subsidy relations forces one to take into consideration the costs and benefits and thus the motivational bases of *both* parties. This is a way to attain an understanding of the basic mechanisms underlying the implementation of a subsidy scheme. In this view the 'deep structure' of the relationship is formed by the self-interest of the parties: what each expects to get out of the relationship is the most important determinant of his behaviour vis-à-vis the other. Thus the approach is most appropriate when a focus on the exchanging dyad is suitable, i.e. when both parties enjoy a relatively high degree of autonomy. When for instance a subsidy scheme is designed and implemented in a negotiation process between two Ministries another approach may be called for.

Furthermore, this approach clearly focuses on the choice of individual agents rather than on the structural restrictions to the exertion of choice. Thus the approach seems to be more fit to analyze a new subsidy scheme that constitutes a break with traditional policies, than an established scheme implemented in the context of an institutionalized 'policy network'.

The conceptualization of subsidy relations as agency relations seems to be adequate if information problems feature predominantly, like in the case of research projects. Subsidy schemes focusing on other functional areas, like plant construc-

tion, may encounter considerably less uncertainty and fewer information problems, and consequently the agency perspective may be less appropriate in these cases.

The ROAG-scheme clearly fits the criteria mentioned above: it was a research subsidy scheme, it was new (and in fact constituted a break with traditional policies), and the Ministry implementing it acted relatively autonomously. Accordingly, the conceptualization of the associated subsidy relations as agency relations yielded a number of expectations with regard to the formal attributes of the scheme that proved to be largely correct. A research subsidy scheme that would deviate substantially from these expectations would make one suspicious as to the effectiveness of the scheme, as the government implementing it would have little means to ensure a proper *quid pro quo* in the exchange with the subsidy recipients.

However, as was shown in the preceding section of this article, the relationship between the government and one particular group of subsidy recipients cannot correctly be understood on the basis of an analysis of the formal properties of the subsidy scheme alone. Big firms like Philips and AKZO have a long-standing relationship with the Ministry of Economic Affairs, and maintain a much richer interaction with civil servants than reflected in the official correspondence. This in contrast with the majority of small and medium-sized firms, which have no such relationship, and can be offered a standardized contract on a 'take it or leave it' basis.

To understand the relationship between the Ministry of Economic Affairs and the 'frame-contract' firms we should obviously consider the actual relations (formal and informal) between the government agency implementing the scheme and the recipient firms. This implies that we have to examine the conversations and negotiations between decision-makers within

both the public and the private sector to track down the 'living law' that rules their interactions. In these cases the words of Ehrlich⁽²⁸⁾ apply: 'There is no other means but this, to open one's eyes, to inform oneself by observing life attentively, to ask people, and note their replies'.

On the basis of the findings in the case study of the ROAG-scheme, three general recommendations for the design and implementation of subsidy schemes can be formulated.

Firstly, in the design of the scheme the government should consider very carefully which conditions and criteria are vital to the effectiveness of the policy, and answer the question whether these conditions and criteria can actually be applied if practical limitations are taken into account. These essential *and* practicable conditions and criteria should be laid down in the scheme and communicated unequivocally to the potential recipients of subsidies.

Secondly, the government should realize that too strict conditions tempt those implementing the policy to water down informally the rules of the scheme. If the conditions of the subsidy scheme are unacceptable to potential recipients, they should be mitigated formally, or the policy should be abandoned altogether.

Finally, if the government faces a substantial information disadvantage vis-à-vis the subsidy recipient, it should make sure that the burden of proof in case of conflicts rests on the subsidy recipient. This can be arranged by including a (mitigated) unilateral termination clause in the subsidy contracts.

APPENDIX

In the course of the case study of the ROAG-scheme in-depth interviews were conducted with 21 respondents: 5 from the

Ministry, and 16 from subsidy-receiving firms. For these interviews standard questionnaires were used. On the basis of the complete transcript of the text, scores on a number of variables have been constructed *post hoc*. These variables among other things pertained to the importance attached to the legal enforceability of the subsidy contract and to trust in the other party, and the significance ascribed to the contractual condition with regard to the obligation to ask the government's permission prior to implementing project changes, and the government's right to withdraw the subsidy in case of non-compliance with any term of the contract.

As these variables were constructed on ordinal scales, non-parametric statistics have been used in the testing for significant relationships. In view of the exploratory purpose of the analysis significance levels as high as 10% have been used. In view of the small size of the sample, and the fact that the choice of the sample was not made with an eye on representativeness but rather guided by pragmatic considerations, the results of the analysis should be interpreted with due care.⁽²⁹⁾

For the measurement of differences between the scores of groups of respondents Mann-Whitney *U* tests were used. For the measurement of correlation coefficients the Spearman rank computation was followed.⁽³⁰⁾ The difference between government respondents and respondents from the 'frame-contract' firms with respect to the importance attached to legal enforceability was significant at the 10% level. The difference between the government respondents and all firm respondents taken together was not significant. The correlation coefficient between the trust and legal enforceability variables was -.520, significant at the 1% level. Finally, the government respondents scored significantly higher on the variable measuring the importance attached to the condition with regard to withdrawal of the subsidy than the 'frame-contract' firms (10% significance level). These firms also scored lower on the previous consent variable, but not significantly so.

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